

## PANICUM IN NICARAGUA

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Recent collections in Nicaragua having added several species to the number previously known to occur there, a report of these additions is here presented. At the same time, citations are given of the specimens on which these and other reports of *Panicum* in Nicaragua are based.

Since the comprehensive treatment by Hitchcock in *The Grasses of Central America* in 1922, more recent papers by Swallen in *Gramineae of Panama* in 1943 and *Grasses of Guatemala* in 1955, have added a number of new species to those known in Central America. Species known in some other part of Central America may at any time be found in Nicaragua. In the hope of extending the known ranges of such species, they have been included in the following pages, --the key for identification and briefly in the annotated list. While primarily concerned with Nicaragua, this treatment serves for other parts of Central America, also.

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The genus *Panicum* L. in the subfamily Panicoideae may be described briefly as follows. Spikelets in racemes or more often in panicles. Glumes herbaceous, the lower (outer) one shorter than the upper (inner) one. The upper glume about equal to the sterile lemma. Fertile lemma and palea hardened (indurated), nerveless. the lemma inrolled over the palea. Herbaceous annuals or perennials.

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As it is often difficult or impossible to tell whether lower leaves are different or similar to upper leaves, because the lower leaves may have fallen, that character, while fundamental for classification in this genus and very useful when observable, has been subordinated in the following key.

Blades described in the following pages are longest blades, unless otherwise stated. There is often wide variation in size on the same stem.

ARTIFICIAL KEY TO SPECIES OF PANICUM  
known to occur in Central America.

- A. Longest blades (and usually others) 21-60 times as long as wide B. cp. p. 4
  - B. Spikelets hairy C.
    - C. Spikelets 2.1-2.5 mm long; blades 23-24 times as long as wide, 3-5 mm wide, 7-12 cm long; lower sheaths villous; panicles 4-6 cm long 70. P. arenicoloides Ashe
    - C. Spikelets 3-3.5 mm long; blades 30-40 times as long as wide D.
      - D. Blades 5-10 mm wide, 15-40 cm long; sheaths papillose-hispid; spikelets sparsely hirsute . . . . . 62. P. Rudgei R. & S.
      - D. Blades 2-4 mm wide, 6-15 cm long; upper sheaths glabrous, lower sheaths hairy; spikelets papillose-villous . . . . . 69. P. fusiforme Hitchc.
  - B. Spikelets glabrous, at least in primary panicles E.
    - E. Sheaths compressed, keeled; lower glume about 1/2 as long as spikelet; sheaths glabrous F.
      - F. Blades 5-12 mm wide, 20-50 cm long; sheaths longer than internodes; spikelets 1.8-2.2 mm long . . . . . 26. P. rigidulum Nees
      - F. Blades 1-5 mm wide, 5-15 cm long; sheaths shorter than internodes; spikelets 2.2-2.4 mm long; sterile palea enlarged, swelling spikelet 27. P. hians Ell.
    - E. Sheaths neither compressed nor keeled G.
      - G. Spikelets 1.4-1.6 mm long; panicle very narrow, few-flowered, 1-2 cm long; blades 2-4 mm wide or less, 4-15 cm long, usually with turned under (revolute) margins, then 0.3-0.5 mm wide; upper sheaths glabrous . . . . . 36. P. stenodes Griseb.
      - G. Spikelets 2-6 mm long H.
        - H. Fruit transversely wrinkled or ridged I.
          - I. Spikelets on 1 side of branches, 2-3 mm long; pedicels short; stems tufted, decumbent at base; blades 10-40 cm long J.

- J. Spikelets 2-2.5 mm long; nodes glabrous; glumes and sterile lemma not papery . . . . .1. P. geminatum Forsk.
- J. Spikelets 2.8-3 mm long; glumes and sterile lemma papery . . . . .2. P. paludivagum H. & C.
- I. Spikelets not on 1 side of branches K.
- K. Spikelets 2.2-2.5 mm long; panicles open, 7-12 cm long, branches stiffly ascending, naked at base; longest blades 8-25 cm long; rootstocks extensively creeping . . . . .31. P. repens L.
- K. Spikelets 3-4.2 mm long; stem 1-2.5 m long; longer blades 25-60 cm long or longer L.
- L. Stems from short stout rootstocks; spikelets 3 mm long; blades 10-20 mm wide . 24. P. maximum Jacq.
- L. Stems from corm-like base; spikelets 3.5-5 mm long M.
- M. Sheaths glabrous; stems leafy; blades 3-12 mm wide; spikelets 3.5-4.2 mm long . . . . .28. P. bulbosum HBK.
- M. Sheaths densely papillose-pilose; stem almost leafless; blades 3-5 mm wide; spikelets 4.5-5 mm long; fruit minutely ridged . . . . .29. P. paucifolium Swallen
- H. Fruit not ridged; spikelets 3-6 mm long N.
- N. Spikelets 5-6 mm long; blades 2-8 mm wide, 10-30 cm long, 40-50 times as long as wide, margins ciliate; lower glume 1/2 as long as spikelet; annual . . . . .103. P. parcum H. & C.
- N. Spikelets 2-5 mm long O.
- O. Upper (and other) sheaths hairy, not only on or near margins P.
- P. Spikelets 4-4.2 mm long; blades 5-10 mm wide, 7-30 cm long; perennial . . . . .21. P. lepidulum H. & C.
- P. Spikelets 2-3.2 mm long, glabrous; lower glume acute Q.
- Q. Spikelets 2-2.2 mm long R.
- R. Panicles 8-20 cm long; blades 5-8 mm wide, 12-20 cm long; annual . . . . .18. P. cayennense Lam.
- R. Panicles 1 cm long; blades 1-2 mm wide, 3-8 cm long . . . . .35. P. stenodoides F. T. Hubb.
- Q. Spikelets 2.5-3.3 mm long S.
- S. Panicles 20-30 cm long; blades 3-5(-12) mm wide, 13-17 cm long; perennial . . . . .22. P. Ghiesbreghtii Fourn.
- S. Panicles 5-15 cm long; blades 4-10 mm wide, 8-25 cm long; annual . .10. P. hirticaule Presl

O. Upper sheaths glabrous except sometimes on or near margins; perennial T.

T. Stem fleshy, often 2 cm thick; spikelets 4-5 mm long; lower glume  $1/4$  as long as spikelet; blades elongate . . . . . 9. P. elephantipes Nees

T. Stem not fleshy, thinner; spikelets 2.2-5 mm long U.

U. Spikelets 2.2-2.8 mm long; lower glume  $1/2$  as long as spikelet; panicles very narrow, few-flowered, 3-8 cm long; blades 2-4 mm wide, 4-15 cm long; rootstock not creeping 25. P. tenerum Beyr.

U. Spikelets 3-5 mm long; lower glume  $2/3$  to  $3/4$  as long as spikelet; panicles wider, many-flowered, 20-40 cm long; stem 1.5-4 m long V.

V. Blades 15-20 mm wide, 40-70 cm long, glabrous, margins rough 30. P. Lundellii Swallen

V. Blades 8-15 mm wide, 30-45 cm long W.

W. Rootstock not creeping; spikelets 3.5-4.2 mm long; blades sometimes villous at base, scabrous above . . . 32. P. ichnanthoides Fourn.

W. Rootstock creeping; blades glabrous above and beneath or pilose near base X.

X. Panicle lax, slightly drooping, branches spreading; spikelets 3-4 mm long, few within 2 cm of main axis . . . . . 33. P. altum H. & C.

X. Panicle stiffly ascending; spikelets 3.5-5 mm long, some usually near main axis . . . 34. Switch-Grass, P. virgatum L.

A. Longest blades (and usually others) 2-20 times as long as wide Y. cp. p. 2

Y. Spikelets large, 3-6 mm long Z. cp. p. 6

Z. Spikelets or fruit hairy a.

a. Stem hairy; spikelets 3.5-4 mm long; blades hairy above and beneath b.

b. Fruit finely transversely wrinkled; spikelets densely hairy; nodes bearded; blades 6-20 mm wide, 5-25 cm long; axis with conspicuous spreading hairs; annual . . . . . 6. P. molle Sw.

b. Fruit not wrinkled; spikelets papillose-hairy; nodes not bearded; blades 6-14 mm wide, 5-12 cm long; perennial . . 89. P. transiens Swallen

a. Stem glabrous c.

c. Blades pilose above and beneath; sterile lemma bearing 1 gland on each side of midnerve; spikelets 3.6 mm long, sparsely hispid . . . . . 47. P. biglandulare Scribner & Smith

- c. Blades glabrous except sometimes ciliate margins; sterile lemma without glands; spikelets 3 mm long, glabrous or sparsely hairy; panicle 5-8 cm long; blades 10-15 mm wide, 6-12 cm long; cp. p. 14 . . . . . 87. P. Joorii Vasey
- Z. Spikelets and fruit glabrous d.
- d. Spikelets 4-6 mm long e.
- e. Spikelets 5.5-6 mm long; blades 8-30 mm wide, 4-15 cm long, 5 times as long as wide, margins very harsh; lower glume 2/3 as long as spikelet; perennial . . . . . 102. P. zizanioides HBK.
- e. Spikelets 4-4.5 mm long; blades 4-10 mm wide, 10-30 times as long as wide f.
- f. Spikelets, some in lower half of panicle; terminal panicle 6-15 cm long, its branches solitary, stiffly ascending; lower glume usually more than 3/4 as long as spikelet; blades 5-12 cm long, 10-12 times as long as wide . . . . . 11. P. pampinosum H. & C.
- f. Spikelets few, borne near ends of branches; terminal panicle up to 20 cm long; lower glume about 1/2 as long as spikelet; blades 7-30 cm long, 14-30 times as long as wide . . . . . 21. P. lepidulum H. & C.
- d. Spikelets 3-3.6 mm long g.
- g. Larger blades 15-30 mm wide; panicles 15-30 cm long h.
- h. Lower glume obscure or at most 1/5 to 1/6 as long as spikelet; stem glabrous; nodes hairy . . . . . 99. P. Tuerckheimii Hackel
- h. Lower glume 1/3 to nearly as long as spikelet; spikelets 3-3.5 mm long, i.
- i. Lower and upper glumes blunt, nearly as long as spikelet; sheaths glabrous or pilose; spikelets 3-3.5 mm long . . . . . 61. P. glutinosum Sw.
- i. Lower glume 1/4 to 1/2 as long as spikelet; sheaths mostly papillose-hispid j.
- j. Panicle stiffly ascending, 23 cm long; lower glume 1/4 to 1/3 as long as spikelet; perennial . . . . . 63. P. Mertensii Roth
- j. Panicle drooping; nodes hairy; blades clasping stem; lower glume 1/3 to 1/2 as long as spikelet; annual . . . . . 17. P. sonorum Beal

- g. Larger blades (2-)4-10(-15) mm wide k.
- k. Sheaths glabrous; blades 5-10 mm wide l.
- l. Blades papillose-pilose or villous above, 8-10 cm long; spikelets 3.5 mm long; panicle 5-8 cm long . . . . . 20. P. sublaeve Swallen
- l. Blades glabrous, 5-12(-17) cm long; spikelets 3 mm long; panicle 10 cm long . . . . . 8. P. aquaticum Poiret
- k. Sheaths hairy or merely papillose without hairs m.
- m. Stems creeping at base; blades 5-10 mm wide; sheaths papillose or papillose-pilose; perennial n.
- n. Blades 10-25 cm long; spikelets glabrous; panicles 10-20 cm long 3. P. purpurascens Raddi
- n. Blades 5-10 cm long; spikelets in primary panicles usually glabrous, those in secondary panicles usually papillose-villous; primary panicles 10-15 cm long 90. P. cordovense Fourn.
- m. Stems not creeping at base; panicles 20-30 cm long; blades 3-13 mm wide, 13-30 cm long; ligule 1.5-3 mm long o.
- o. Sheaths, stems and blades papillose-hispid; spikelets 3.5-3.6 mm long; blades 8-13 mm wide, 15-30 cm long; annual . . . . . 19. P. hispidifolium Swallen
- o. Sheaths, nodes, and blades hirsute; spikelets 2.7-3.2 mm long; longest blades 3-5(-12) mm wide, 13-17 cm long; perennial . . . . . 22. P. Ghiesbreghtii Fourn.
- Y. Spikelets smaller, 1-3 mm long p. cp. p. 4
- p. Spikelets (1-)1.3-1.9(-2) mm long; sheaths slightly hairy to glabrous or hairy only on margins q. cp. p. 11
- q. Spikelets or fruit hairy, sometimes only slightly hairy r. cp. p. 8
- r. Ligule (2-)3-5 mm long; spikelets 1.2-2 mm long; larger blades (2-)4-8 mm wide, (3-)4-8 cm long; blades hairy or at least puberulent beneath s.
- s. Spikelets 1-1.2 mm long; blades minutely hairy beneath t.
- t. Spikelets 1 mm long 74. P. Wrightianum Scribner
- t. Spikelets 1.2 mm long 73. P. longiligulatum Nash
- s. Spikelets 1.6-2 mm long; blades hairy on both surfaces; sheaths mostly shorter than internodes; nodes usually bearded u.

- u. Spikelets. sparsely hairy or nearly glabrous; upper glumes and sterile lemma slightly surpassing fruit; upper blades (and others) 9-13 mm wide, 5-13 cm long; basal blades similar to upper blades . . . . . 86. P. viscidellum Scribner
- u. Spikelets abundantly hairy; upper glume and sterile lemma scarcely equaling fruit; upper blades 5-10 mm wide, 4-10 cm long; axis of panicle pilose; basal blades different from upper blades v.
- v. Blades puberulent on both surfaces, short-villous also above and long-villous toward base; plant olive-green when dry . . . . . 77. P. olivaceum H. & C.
- v. Blades with long and short soft hairs above, with dense velvety pubescence beneath; plant light- or yellow-green when dry . . 79. P. lanuginosum Ell.
- r. Ligule 0.5 mm long or less or none w.
- w. Axis of panicle hairy (pilose); panicles 4-8 cm long; spikelets 1.2-2 mm long; blades 3-15 mm wide, 2-12 cm long x.
- x. Sheaths glabrous except densely hairy collar; blades white-margined 5-12 mm wide, (4-)5-15 cm long; spikelets crowded; lower glume minute; spikelets 1.5 mm long; fruit bearing long hairs; perennial . . . . . 60. P. arundinariae Trin.
- x. Sheaths hairy; spikelets hairy; blades not white-margined y.
- y. Spikelets oblique on pedicels, 1.2-1.4 mm long; blades 8-15 mm wide, 2-6 cm long, papillose-hispid toward base, heart-shaped at base; panicles 5-7 cm long . . . . . 101. P. hirtum Lam.
- y. Spikelets erect on pedicels; lower glume 1/3 as long as spikelet z.
- z. Spikelets 1.5-1.6 mm long, sparsely pilose; sheaths papillose-hispid; widest blades 5-10 mm wide, 2.5-4.3 cm long, 4-5 times as long as wide, heart-shaped and clasping at base, sparsely hairy . . . . . 95. P. Blakei Swallen
- z. Spikelets 1.9-2 mm long, with dense spreading hairs; sheaths conspicuously retrorse-pilose; widest blades 3-8 mm wide, 4-12 cm long, 13-15 times as long as wide, long-ciliate on margins, not heart-shaped at base, pilose above and beneath . . . . . 64. P. xalapense HBK.
- w. Axis of panicle glabrous Aa.
- Aa. Blades heart-shaped at base, clasping stem, 5-15 mm wide Ab.

- Ab. Blades with white cartilaginous margins, 7-14 mm wide, 4-10 cm long; spikelets 1.6-1.8 mm long, hairy or nearly glabrous; sheaths usually longer than internodes, glabrous except on margins . . . . . 80. P. sphaerocarpon Ell.
- Ab. Blades without white margins, 6-12 mm wide, 7-13 cm long; spikelets 1-1.2 mm long, densely puberulent . . . . . 81. P. erectifolium Nash
- Aa. Blades not heart-shaped at base, not clasping stem Ac. cp. p. 7.
- Ac. Fruit bearing long hairs; spikelets 1.5-1.8 mm long; sheaths shorter than internodes Ad.
- Ad. Stem retrorsely pilose (or almost glabrous), rooting at nodes; panicles 10-15 cm long; blades 10-25 mm wide, 5-15 cm long; sheaths pilose . . . . . 48. P. Schiffneri Hackel
- Ad. Stem glabrous or nearly so, creeping at base; nodes hairy; panicles 3-8 cm; blades 7-19 mm wide, 6-11 cm long, falcate; sheaths hairy toward summit; spikelets 1.8 mm long . . . . . 49. P. Schmitzii Hackel
- Ac. Fruit glabrous; spikelets hairy Ae.
- Ae. Sheaths, at least upper ones, glabrous or with few hairs near base; stems erect or ascending or spreading, often tufted; spikelets hairy, 1.4 mm long; blades with conspicuous white margins; blades 4-6 mm wide, 4-6 cm long; perennial . . . . . 82. P. albomarginatum Nash
- Ae. Sheaths distinctly hairy Af.
- Af. Widest blades 8-15 mm wide, 4-7 cm long, about 5-7 times as long as wide; spikelets 1.5 mm long, pilose or nearly glabrous; stems decumbent or creeping; annual . . . . . 51. P. trichoides Sw.
- Af. Widest blades 3-8 mm wide, 4-12 cm long, 13-15 times as long as wide, long-ciliate on margins; sheaths conspicuously retrorsely pilose; spikelets with abundant spreading hairs; stems erect or spreading . . . . . 64. P. xalapense HBK.
- q. Spikelets and fruit glabrous (except sometimes scabrous keel) spikelets (1-)1.3-1.9(-2) mm long Ag. cp. p. 6
- Ag. Spikelets attenuate at base, pear-shaped; blades 2-7 mm wide, 1-3 cm long, clasping at base, glabrous or sparsely pilose; panicles 2-5 cm long; lower glume acute, 1/2 as long as spikelet; annual . . . . . 57. P. pyricularium H. & C.
- Ag. Spikelets not attenuate at base; blades (6-)7-20 times as long as wide, (2-)5-30 mm wide; spikelets (1-)1.3-1.9 mm long Ah.



- Ah. Spikelets arranged along 1 side of branches, dense, nearly sessile; branches pilose with long (2-3 mm) scattered hairs; blades 7-15 mm wide, 6-13 times as long as wide Ai.
- Ai. Spikelets all on main branches Aj.
- Aj. Panicles 5-15 cm long; spikelets 1.3-1.5 mm long; larger blades 6-10 mm wide, 5-20 cm long; stems not more than 1 m long; sheaths longer than internodes; axis of inflorescence hairy 39. P. pilosum Sw
- Aj. Panicles 25-45 cm long; spikelets 1.8-1.9 mm long; larger blades 5-11 mm wide, 20-28 cm long; stems less than 1 m long . . . 43. P. hondurensense Swallen
- Ai. Spikelets, some of them, on very short secondary branches, usually on lower side of main branches; perennial Ak.
- Ak. Blades 15-35 cm long, 12-30 mm wide; panicles 20-45 cm long; lower sheaths shorter than internodes Al.
- Al. Spikelets 1.3 mm long; nodes hairy . . . . . 40. P. milleflorum H. & C.
- Al. Spikelets 1.8 mm long; nodes glabrous or sparsely hairy . . . . . 97. P. stagnatile H. & C.
- Ak. Blades 5-15(-20) cm long, 5-20 mm wide; panicles 5-30 cm long Am.
- Am. Nodes hairy; blades 5-10(3-13) mm wide, mostly 5-8 cm long . . 38. P. polygonatum Schrader
- Am. Nodes glabrous; larger blades 5-15 cm long; sheaths shorter than internodes An.
- An. Spikelets 2 mm long; blades 4-12 mm wide, 1.5-6 cm long, with white undulate margins; annual . . . . . 5. P. reptans L
- An. Spikelets 1-1.6 mm long; blades without white margins, nearly glabrous Ao.
- Ao. Blades narrowed toward base, 5-10(-15) mm wide, 5-12 cm long; spikelets 1-1.5 mm long; sheaths with dense hairy line on collar . . . . . 42. P. laxum Sw.
- Ao. Blades heart-shaped at base, 7-20 mm wide, 5-15(-20) cm long, glabrous on both surfaces; spikelets 1.5-1.6 mm long; perennial . . . 41. P. boliviense Hackel
- Ah. Spikelets not on 1 side of branches, sometimes with long pedicels; inflorescence open or contracted Ap.
- Ap. Ligule (2-)3-4 mm long; sheaths mostly shorter than internodes Aq.

- Aq. Blades glabrous or scaberulous, strictly erect; sheaths about  $1/2$  as long as internodes; lower glume obtuse or rounded,  $2/3$  as long as spikelet; stem erect . . . . . 56. P. cyanescens Nees
- Aq. Blades hairy on both surfaces; lower glume almost acute,  $1/3$  as long as spikelet; stem creeping at base . . . . . 86. P. viscidellum Scribner
- Ap. Ligule 0.5 mm long or shorter or none Ar.
- Ar. Sheaths distinctly hairy (pilose) As.
- As. Spikelets 1.5 mm long; longest blades 2-4 mm wide, 1.5-2.5 cm long, 6-7 times as long as wide; sheaths 0.6-0.8 mm thick, with stiff ascending or spreading hairs; spikelets 1.5 mm long . . . . . 55. P. parvifolium Lam.
- As. Spikelets 1.9-2 mm long; longest blades 3-8 mm wide, 4-12 cm long, 13-15 times as long as wide; sheaths retrorse-pilose; spikelets 1.9-2 mm long . cp. p. 9 . . . . . 64. P. xalapense HBK.
- Ar. Sheaths, at least upper ones, glabrous except on margins or collar or base At.
- At. Stems sprawling or clambering, often rooting at lower nodes; sheaths shorter than internodes; perennial Au.
- Au. Spikelets 1.8-2 mm long; lower glume  $1/2$  as long as spikelet; blades 15-25 mm wide, 10-20 cm long; fruit smooth; panicle 10-30 cm long . . . . . 53. P. Bartlettii Swallen
- Au. Spikelets 1.2-1.5 mm long; lower glume less than  $1/2$  as long as spikelet; basal blades similar to upper blades, not forming winter rosette Av.
- Av. Lower glume minute, nerveless; fruit with long appressed hairs; basal blades similar to upper blades, not forming winter rosette; upper blades 5-12 mm wide, 4-15 cm long; spikelets 1.5 mm long, crowded . . . . . 60. P. arundinariae Trin.
- Av. Lower glume  $1/5$  as long as spikelet; fruit glabrous; blades 10-20 mm wide, (7-)8-15 cm long . . . . . 52. P. trichanthum Nees
- At. Stems erect or ascending or spreading, often tufted Aw.
- Aw. Axis of panicle pilose; lower glume  $1/3$  to  $1/2$  as long as spikelet; fruit glabrous; basal blades different from upper blades, forming winter rosette; stems in dense spreading tufts Ax.

- Ax. Spikelets 1.3-1.5 mm long; blades pilose on both surfaces . . . . . 66. P. strigosum Muhl.
- Ax. Spikelets 1.5-1.6 mm long; blades glabrous above, ciliate on margins . . . . . 65. P. polycaulon Nash
- Aw. Axis of panicle glabrous; sheaths glabrous or with few long hairs near base Ay.
- Ay. Panicle very narrow, few-flowered; blades 2-4 mm wide or narrower, 4-15 cm long, usually with turned under (revolute) margins, then 0.3-0.5 mm wide; panicle 1-2 cm long; spikelets 1.4-1.6 mm long . . . . . 36. P. stenodes Griseb.
- Ay. Panicle open, many-flowered; blades 2-6 mm wide, 1.5-6.5 cm long; panicle 2.5-5 cm long; stems densely tufted Az.
- Az. Spikelets 1.1-1.2 mm long . . . . . 83. P. chamaelonche Trin.
- Az. Spikelets 1.5-1.6 mm long 37. P. furvum Swallen
- p. Spikelets 2-3 mm long Ba. cp. p. 6
- Ba. Stem-blades (2-)3-9 times as long as wide; perennial except P. alcobense which is uncertain Bb. cp. p. 13
- Bb. Ligule of hairs (2-)3-5 mm long; sheaths hairy; spikelets 1.9-2.4 mm long, hairy; basal blades wider and shorter proportionately than upper blades Bc.
- Bc. Blades velvety-hairy; spring stems more than 75 cm tall; spikelets 2 mm long; larger blades 5-13 cm long; cp. p. 14 . . 86. P. viscidellum Scribner
- Bc. Blades somewhat villous; spring stems less than 50 cm tall; spikelets 1.9-2 mm long; larger blades 4-7 cm long; cp. p. 7 . . . . . 77. P. olivaceum H. & C.
- Bb. Ligule very short, 0.5-1 mm long, or none Bd.
- Bd. Lower glume  $2/3$  to  $3/4$  as long as spikelet; spikelets 2-2.7 mm long Be.
- Be. Blades 10-30 mm wide, 4-15 cm long, 4-5 times as long as wide, at least sparsely hairy; panicles 10-20 cm long; spikelets glabrous or sparsely hairy . . . . . 59. P. Sellowii Nees
- Be. Blades 5-10 mm wide, 4-7 cm long, 6-8 times as long as wide Bf.
- Bf. Spikelets hairy; blades 7-10 mm wide, 4-7 cm long, papillose-pilose; panicle 10 cm long or shorter; spikelets 2.7 mm long . . . . . 96. P. pantrichum Hackel
- Bf. Spikelets glabrous; blades 5-10 mm wide, 4-6 cm long; plant glabrous . . . . . 54. P. helobium Mez

Bd. Lower glume not more than  $1/2$  as long as spikelet; spikelets 2-2.7 mm long Bg.

Bg. Spikelets sessile or almost sessile, glabrous, arranged along 1 side of branches; pedicels up to 1 mm long Bh.

Bh. Fruit transversely wrinkled; larger blades 4-12 mm wide; lower glume rounded or truncate,  $1/6$  as long as spikelet; stem long-creeping . . . 5. P. reptans L.

Bh. Fruit not transversely wrinkled; lower glume acute,  $1/3$  to  $1/2$  as long as spikelet; stem decumbent at base, rooting at lower nodes Bi.

Bi. Sterile lemma bearing 2 crater-like glands; panicles 3-14 cm long; spikelets 2 mm long; blades 8-18 mm wide, 1.5-5 cm long . . . . .  
 . . . . . 46. P. pulchellum Raddi

Bi. Sterile lemma without glands; nodes hairy; spikelets 2.5-2.7 mm long; perennial Bj.

Bj. Blades 1-5 cm long, 3-15 mm wide; panicles 1-5 cm long . . 44. P. stoloniferum Poirlet

Bj. Blades 5-11 cm long, 8-15 mm wide; panicles 4-11 cm long . . 45. P. frondescens Meyer

Bg. Spikelets on pedicels, not on 1 side of branches; longest pedicels 1-2(-3) mm long; panicle open Bk.

Bk. Lower glume  $1/5$  to  $1/4$  as long as spikelet; longer blades 12-25 mm wide Bl.

Bl. Spikelets 2.3-2.5 mm long; stem villous; blades hairy above and beneath 91. P. cayoense Swallen

Bl. Spikelets 2 mm long; stem papillose-pilose; blades usually hairy, very scabrous on margins and upper surface . . 50. P. parviglume Hackel

Bk. Lower glume  $1/3$  to  $1/2$  as long as spikelet Bm.

Bm. Blades glabrous except on margins, or minutely or sparsely hairy; nodes hairy; spikelets 2.7 mm long, sparsely hairy; blades 5 mm wide, 4-7.5 cm long . . . 92. P. alcobense Swallen

Bm. Blades abundantly hairy Bn.

Bn. Panicle 10-15 cm long; sheaths usually much shorter than internodes; margins of glumes and sterile lemma sparsely pilose; spikelets 2.5 mm long 58. P. Haenkeanum Presl

Bn. Panicle 1-8(-9) cm long; spikelets 2-2.4 mm long Bo.

Bo. Nodes hairy; spikelets glabrous, 2.2-2.4 mm long; blades hairy, 7-13 mm wide, 5-9 cm long; sheaths densely hairy . . 93. P. ramiparum Swallen

- Bo. Nodes glabrous; spikelets 2-2.1 mm long Bp.
- Bp. Blades 6-12 mm wide, 2-7 cm long, hairy above and beneath; spikelets glabrous or sparsely pilose; lower glume  $1/3$  as long as spikelet . . . . . 94. P. furtivum Swallen
- Bp. Blades 3-8 mm wide, 2-8 cm long, with very narrow white margins Bq.
- Bq. Blades glabrous above; stems not decumbent at base . . . . . 84. P. lancearium Trin.
- Bq. Blades softly puberulent above and beneath; stems decumbent at base . . . . . 85. P. patulum (Scribner & Merrill) Hitchc.
- Ba. Stem-blades 10-50 times as long as wide Br. cp. p. 11
- Br. Blades 6 cm wide, 100 cm long, at middle of stem; nodes densely appressed-hairy; stem 1-2 cm thick . . . . . 98. P. grande H. & C.
- Br. Blades 0.2-4 cm wide Bs.
- Bs. Spikelets or fruit hairy Bt. cp. p. 14
- Bt. Spikelets attenuate at base, their hairs swollen at base; blades 5-12 cm long, 10-15 (-17) times as long as wide; spikelets 2-2.5 mm long; perennial Bu. cp. p.
- Bu. Spikelets 2.4-2.5 mm long; larger blades 8-12 cm long; autumnal blades flat . . . . . 68. P. angustifolium Ell.
- Bu. Spikelets 2 mm long; branches appressed; autumnal blades rolled up Bv.
- Bv. Lowest internodes crisp-hairy; larger blades 4-6 mm long . . . . . 67. P. aciculare Desv.
- Bv. Lowest internodes glabrous; larger blades 8-12 cm long; plants glabrous or nearly so . . . . . 71. P. neuranthum Griseb.
- Bt. Spikelets not attenuate at base; larger blades 2-20 cm long Bw.
- Bw. Ligule very short, inconspicuous, less than 1 mm long Bx.
- Bx. Spikelets 2 mm long; nodes, at least upper ones, bearded; sheaths, except sometimes the lowest, glabrous; longest blades 5-20 cm long . . . . . 72. P. nitidum Lam.
- Bx. Spikelets 2.4-2.8 mm long, glabrous or upper glume sparsely pilose By.

- By. Sheaths glabrous except densely ciliate margins; panicles 10-16 cm long; blades glabrous or sparsely hispid, ciliate at base 88. P. albomaculatum Scribner
- By. Sheaths papillose or papillose-hispid or papillose-pilose, as long or longer than internodes Bz.
- Bz. Blades 4-9 mm wide, 5-10 cm long; spikelets 2.4 mm long; fruit glabrous . . . . . 12. P. alsophilum Swallen
- Bz. Blades 9-18 mm wide, 13-22 cm long; spikelets 2.9-3 mm long; fruit silky-villous . . . . . 100. P. incumbens Swallen
- Bw. Ligule of hairs (2-)3-5 mm long Ca.
- Ca. Sheaths glabrous Cb.
- Cb. Spikelets 2 mm long, finely hairy; blades 3-6 cm long . . . . . 76. P. multirameum Scribner
- Cb. Spikelets 3 mm long, hairy; blades 10-15 mm wide, 5-12 cm long, glabrous; spikelets on border line for this place in key . . . . 87. P. Joorii Vasey
- Ca. Sheaths hairy; spikelets 1.9-2.4 mm long; larger blades 5-13 cm long Cc.
- Cc. Blades velvety-hairy above and beneath; spring stems more than 75 cm tall; spikelets 2 mm long, hairy or glabrous; cp. p. 11 . . . . . 86. P. viscidellum Scribner
- Cc. Blades somewhat villous or pilose; spring stems less than 50 cm tall; spikelets 2.2-2.4 mm long, papillose-hairy; larger blades 6-11 cm long Cd.
- Cd. Stems conspicuously hairy with long spreading hairs; autumnal stems prostrate; spikelets 2.2-2.3 mm long . 78. P. villosissimum Nash
- Cd. Stems with appressed hairs; autumnal stems stiffly ascending 75. P. pseudopubescens Nash
- Bs. Spikelets glabrous Cd. cp. p. 13
- Ce. Nodes hairy Cf.
- Cf. Panicle 20-60 cm long; spikelets 2-3.2 mm long Cg.
- Cg. Fruit transversely wrinkled; lower glume 1/3 as long as spikelet; blades glabrous or nearly so, 10 mm wide, 30-50 cm long or longer; spikelets 3 mm long . . 24. P. maximum Jacq.
- Cg. Fruit smooth; lower glume 1/2 as long as spikelet Ch.
- Ch. Blades hairy on both surfaces, 3-5(-12) mm wide, 13-17 cm long; spikelets 2.7-3.2 mm long . . . . . 22. P. Ghiesbreghtii Fourn.

- Ch. Blades glabrous or nearly so on both surfaces, 15-40 mm wide, 30-60 cm long; spikelets 2 mm long . . . . . 23. P. hirsutum Sw.
- Cf. Panicle 2-15(-20) cm long; blades hairy above and beneath, 2-10 mm wide, 2-10(-25) cm long Ci.
- Ci. Spikelets 1.8-1.9 mm long, hairy; sheaths shorter than internodes; blades 9-13 mm wide, 5-13 cm long; branches of panicle hairy 86. P. viscidellum Scribner
- Ci. Spikelets 2.2-3 mm long, 1/2 as long as spikelet or shorter Cj.
- Cj. Stems erect; spikelets 2.2 mm long; blades 5-8 mm wide, 12-20 cm long; annual . . . . . 18. P. cayennense Lam.
- Cj. Stems spreading or decumbent or prostrate or clambering or erect, often rooting at the lower nodes; spikelets 2.4-3 mm long; blades 2-9 mm wide, 5-10 cm long Ck.
- Ck. Blades almost glabrous except on margins and near base; spikelets 2.4-2.5 mm long; sheaths usually longer than internodes; perennial . . . . . 16. P. umbonulatum Swallen
- Ck. Blades hairy on both surfaces; spikelets 2.5-3 mm long; sheaths shorter than internodes; perennial . . . . . 13. P. venezuelae Hackel
- Ce. Nodes glabrous Cl. cp. p. 14
- Cl. Panicles very narrow, few-flowered, 3-8 cm long; blades 2-4 mm wide, 4-15 cm long; spikelets 2.2-2.8 mm long; blades usually more than 20 times as long as wide; perennial . . . . . 25. P. tenerum Beyr.
- Cl. Panicles many-flowered, usually wider; ligule 0.2-1.5 mm long Cm.
- Cm. Blades with narrow white margins; sheaths on main stem much shorter than internodes; pedicels shorter than spikelets; blades 4-10 mm wide, 7-12 cm long; spikelets 2.2-2.4 mm long perennial . . . . . 15. P. guatemalense Swallen
- Cm. Blades without white margins Cn.
- Cn. Fruit strongly transversely ridged; longest blades 9-20 mm wide, 9-26 cm long; spikelets 2.5-3 mm long; annual . . . 4. P. fasciculatum Sw.
- Cn. Fruit not transversely ridged Co.
- Co. Panicles 4.5-5.5 cm long; lowermost branch 1-1.5 cm long; sheaths glabrous except densely hairy collar, mostly shorter than internodes; blades 4-9 mm wide, 4-10 cm long . . . 14. P. breviramum Swallen

Co. Panicles 8-20 cm long; lower glume 1/4 as long as spikelet, truncate or widely triangular; sheaths glabrous; spikelets 2.5 mm long; blades 5-8 mm wide, about 10 cm long . . . . . 7. P. chloroticum Nees

ANNOTATED LIST OF SPECIES OF PANICUM  
known to occur in Central America.

References to Hitchcock on the following pages are to A. S. Hitchcock, Grasses of Central America, Contr. U. S. Nat. Herb. 24:557-802. 1922. Descriptive data are sometimes given, especially in cases where the information is not always found in other publications.

1. P. geminatum Forsk., Fl. Aegypt. Arab. 18.1775.  
Sheaths inflated. Similar to P. paludivagum.  
Guatemala, Salvador, Costa Rica, Panama.  
Nicaragua, Dept. Zelaya, Puerto Isabel, Atwood 2938  
(SEY, SMU, BM, GH, F).  
Dept. Leon, Leon Viejo, Dudey 1522 (VT):  
Seymour 1557 (ENAG, SEY, MO, UC).  
Dept. Managua, Managua, Grant 1103 (GH).  
Sierras de Managua, Grant 1075 (GH), 1076 (GH).  
Without definite locality, Garnier 1494 (GH), 4424 (GH).
2. P. paludivagum H. & C., Contr. U. S. Nat. Herb. 15:32, f. 13. 1910. Blades 3-6 mm wide. Florida, Texas, Mexico, Guatemala, S. A.
3. P. purpurascens Raddi, Agrost. Bras. 47. 1823.  
P. barbinode Trin., Mem. Acad. St. Petersburg VI. Sci. Nat. 1:256. 1834. Parana Grass or Para.  
Similar in habit to Brachiaria plantaginea (Link) Hitchc.  
British Honduras, Guatemala (FLAS), Honduras, Salvador, Costa Rica, Panama.  
Nicaragua, Dept. Zelaya, Corn Island, Seymour 4401  
(SEY, F, MO, UC, NY, WDP).  
Dept. Chinandega, Chinandega, Baker 2053 (GH).  
Dept. Managua, La Calera (ENAG).  
Dept. Rio San Juan, San Bartolo, Seymour 6143 (VT).  
Without definite locality, Garnier 1537 (GH), A-1234 (GH).



4. P. fasciculatum Sw., Prodr. Veg. Ind. Occ. 22. 1788.  
Zacate de Milpa. Nodes glabrous. Florida, Mexico (FLAS),  
in all countries of Central America, W. I. to S. A.  
Nicaragua. Dept. Zelaya, a lo largo Rio Grande, Molina 2343  
(GH).

Dept. Chinandega, Ameyá, MHV 7177 (GH).

Dept. Boaco, San Francisco, Seymour 6059 (ENAG, SEY,  
SMU, BM, GH, F, MO, UC, NY, WDP).

Dept. Managua, Managua, Seymour 6106 (FLAS),  
Seymour 6290 (ENAG, SEY, SMU, BM, GH, F, MO,  
UC, NY, WDP, MICH).

Tipitapa (ENAG).

Dept. Rivas, Rivas 3905 (ENAG).

Without definite locality, Garnier 1558 (GH).

5. P. reptans L., Syst. Nat. ed. 10. 2:870. 1759.

To prevent this species from being confused with P. repens L.,  
with similar name and some similar characters, note the follow-  
ing key. Both species are with creeping rootstocks or bases;  
spikelets glabrous; lowest glume truncate; basal leaves similar  
to upper leaves.

A. Annual; fruit transversely ridged; spikelets secund; pedicels  
1 mm long; blades 4-12 mm wide, 1.5-6 cm long, 4-5 times  
as long as wide . . . . . 5. P. reptans L.

A. Perennial; fruit not transversely ridged; spikelets not secund,  
long-pedicelled; blades 2-5 mm wide, 8-25 cm long, 40-50  
times as long as wide; lower glume 1/5 as long as spikelet  
. . . . . 30. P. repens L.

Texas to Florida, Mexico (FLAS), Costa Rica, Old World.

Nicaragua, Dept. Matagalpa, Calabazas, Seymour 2577 (SEY,  
SMU).

Dept. Boaco, San Francisco, Seymour 6058 (VI).

Teustepe, Seymour 2415 (SEY, MO).

Dept. Rivas, Rivas 3919 (ENAG).

Without definite locality, Garnier 1528 (GH).

6. P. molle Sw., Prodr. Veg. Ind. Occ. 22. 1788; non Mx.,  
Fl. Bor. Amer. 1:47. 1803. Spikelets and axis of inflores-  
cence with conspicuous spreading hairs.

Mexico (FLAS), Guatemala, Salvador, Costa Rica, Panama,  
W. I. to Argentina.

Nicaragua, Dept. Chinandega, Coseguina Volcano, Howell 10255  
(GH).

Dept. Managua, Tipitapa, Seymour 3433 (ENAG, SEY, SMU,  
BM, GH, F, MO, UC, NY, WDP, WIS, MICH).

Dept. Rivas, El Limon (ENAG);

Sapoa, Seymour 1885 (SEY, NY).

Without definite locality, Garnier 1534 (GH).

7. P. chloroticum Nees, in Trin. Gram. Pan. 236. 1826.  
Sheaths not noticeably inflated. Spikelets glabrous, about 2.5 mm long. Mexico, Panama (GH). Nodes glabrous.
8. P. aquaticum Poiret, in Lam. Encycl. Suppl. 4:281. 1816.  
Mexico, British Honduras, Guatemala, Costa Rica (Brittonia 23: 293. 1971), Cuba, S. A.  
Nicaragua, Dept. Zelaya, Puerto Isabel, Seymour 2895  
(ENAG, SEY, SMU, GH, MO).
9. P. elephantipes Nees, Agrost. Bras. 165. 1829.  
Central America according to Hitchcock. Guatemala (GH), W. I., S. A.
10. P. hirticaule Presl, Rel. Haenk. 1:308. 1830.  
Spikelets glabrous. Lower glume acute or acuminate.  
Mexico (FLAS), Salvador, Costa Rica, Panama, W. I., S. A.  
Nicaragua, Dept. Managua, Managua, Seymour 2829 (SMU, BM),  
3897 (VT), 6033 (ENAG, SEY, GH, MO), 6275 (SEY), 6284  
(ENAG, SEY, F, MO).  
Without definite locality, Garnier 4476 (GH).
11. P. pampinosum H. & C., Contr. U. S. Nat. Herb. 15:66, f. 48. 1910. Blades 5-10 mm wide, 5-12 cm long, 10-12 times as long as wide. New Mexico, Arizona, Mexico, Guatemala.  
Nicaragua, without definite locality, Garnier 4421 (GH).
12. P. alsophilum Swallen, Contr. U. S. Nat. Herb. 29:422. 1950. Guatemala. Nodes hairy.
13. P. venezuelae Hackel, Oesterr. Bot. Zeitschrift 51:368. 1901. Guatemala, Venezuela, Brazil. Nodes hairy.
14. P. breviramsum Swallen, Contr. U. S. Nat. Herb. 29: 419. 1950. Guatemala. Nodes glabrous.
15. P. guatemalense Swallen, Journ. Wash. Acad. Sci. 23: 460. 1933. Guatemala.
16. P. umbonulatum Swallen, Contr. U. S. Nat. Herb. 29: 420. 1950. Spikelets 2.4-2.5 (-3) mm long. Nodes hairy.  
Guatemala, Honduras.
17. P. sonorum Beal, Grasses N. Amer. 2:130. 1896.  
Blades "elongate", 15-30 mm wide. Spikelets glabrous, 3-3.3 mm long. Yuma, Ariz., El Salvador, San Salvador, where probably introduced, according to Hitchcock.  
Nicaragua, Dept. Chinandega, Cosequina (ENAG).
18. P. cayennense Lam., Tabl. Encycl. 1:173. 1791.  
S. Mexico, British Honduras, Honduras according to Hitchcock, Costa Rica, Panama, W. I., n. S. A. Nodes hairy.
19. P. hispidifolium Swallen, Contr. U. S. Nat. Herb. 29: 424. 1950. P. hispidum Swallen, Contr. U. S. Nat. Herb. 29: 269. 1949; non Forst. 1786; non Muhl. 1817. Spikelets at tips of branches. Blades 6-13 mm wide, 15-30 cm long. Honduras.  
Nicaragua, Dept. Managua, Tipitapa (ENAG).

20. P. sublaeve Swallen, Contr. U. S. Nat. Herb. 29:424. 1950. P. rigidum Swallen, Ann. Mo. Bot. Gard. 30:215. 1943; non Balif. 1884. A few short hairs at tip of fruit are easily overlooked. From the original description: Sheaths longer than internodes; leaves with margins and lower surface glabrous, upper surface pilose or villous; lower glume 1.5 mm long, acute; upper glume and sterile lemma acute, exceeding fruit. Panama.
21. P. lepidulum H. & C., Contr. U. S. Nat. Herb. 15:75, f. 64. 1910. Mexico, Guatemala; Nicaragua, Omotepe Is. according to Hitchcock; Panama ?
22. P. Ghiesbreghtii Fourn., Mex. Pl. 2:29. 1886. Spikelets glabrous. See Burkhart, Arturo, Fl. Illustr. de Entre Rios (Argentina) 2:309-310. 1969, where he says: spikelets 2.7-3.2 mm long; blades approximately 3-5 (-12) mm wide, 13-17 cm long; ligule 1.5-2.5 mm long; panicles 20-30 cm long. (translation mine). Blades hairy on both surfaces. Nodes hairy. Mexico, Costa Rica, Panama, W. I. to Brazil and Bolivia, Argentina. Nicaragua, Dept. Rivas, El Carabato (ENAG).
23. P. hirsutum Sw., Fl. Ind. Occ. 1:173. 1797. Nodes hairy. Honduras according to Hitchcock. Guatemala (FLAS), Costa Rica, Panama to Ecuador, Brazil.
24. P. maximum Jacq., Coll. Bot. 1:76. 1786. Zacate de Guinea, Guinea Grass. Longest blades 30-50 cm long or longer. Introduced from Africa. For fuller comment, see Williams, L. O., Phytologia 28:226. 1974. Nodes hairy. Florida, Mexico (FLAS), Guatemala, Honduras, Panama (FLAS), to Ecuador, Brazil. Africa.  
Nicaragua, Dept. Zelaya, between Rio Grande and Wenkala, Molina 2219 (GH).  
Dept. Matagalpa, Matagalpa, Zelaya 2307 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH).  
Dept. Leon, Momotombo, El Diamante (ENAG).  
Dept. Managua, La Calera (ENAG).  
Managua, Seymour 2448 (VI).  
Managua, Zelaya 735 (ENAG, SEY, SMU, BM, GH, F, MO), 2244 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH), 2246 (FLAS, B).
25. P. tenerum Beyr., in Trin. Acad. St. Petersb. Mem. VI Sci. Nat. 1:341. 1834. North Carolina to Florida and Texas, British Honduras, W. I.
26. P. rigidulum Bosc ex Nees in Mart. Fl. Bras. 2(1):163. 1829. P. agrostoides Bosc ex Sprengel, Pl. Pugill. 2:4. 1815. For discussion of name, see Voss, E. G. Rhodora 68:443. 1966. U. S. east of Rocky Mts., Calif., Vancouver Is., British Honduras.

27. P. hians Ell., Bot. S. C. and Ga. 1:118. 1816.  
SE United States, SE of Rocky Mts., New Mexico, Mexico,  
Guatemala, Honduras, Panama.
28. P. bulbosum HBK., Nov. Gen. & Sp. 1:99. 1816.  
New Mexico, Arizona, Mexico, Guatemala, n. S. A.  
Nicaragua, Dept. Managua, Managua, Seymour 6274 (SEY).  
Tipitapa, Seymour 3439 (SEY, SMU).
29. P. paucifolium Swallen, Contr. U. S. Nat. Herb. 29:417.  
1950. Honduras.
30. P. Lundellii Swallen, Journ. Washington Acad. Sci. 28:9.  
1938. British Honduras.
31. P. repens L., Sp. Pl. ed. 2, 1:87. 1762.  
Stems arising from horizontal creeping rootstocks; blades 2-5  
mm wide, 12-20 cm long; spikelets 2.2-2.5 mm long; lowest  
glume truncate, 1/5 as long as spikelet. For fuller description,  
see Chase, Agnes, Manual of Grasses of the U. S. 697. 1951,  
where illustrated. See also P. reptans L., p. 17, this article.  
Spikelets on pedicels. Nicaragua, Flint (GH). Specimen not seen.
32. P. ichnanthoides Fourn., Mex. Pl. 2:30. 1886.  
Blades 2.5-3.5 cm long. S. Mexico, British Honduras, Honduras.  
Nicaragua, Dept. Carazo, Jinotepe. Specimens not seen.
33. P. altum H. & C., Contr. U. S. Nat. Herb. 17:488. 1915.  
2 specimens in the Gray Herbarium from Central America are  
Hitchcock 507, Panama; and Peck 123, British Honduras. Ac-  
cording to my measurements, spikelets on these specimens  
measure 2.9-3.9 mm long.  
British Honduras, Honduras, Costa Rica, Panama (USF).  
Nicaragua, Dept. Managua, Managua, Seymour 6094 (SEY, MO).
34. P. virgatum L., Sp. Pl. 59. 1753.  
Reported in British Honduras, Belize. Rhodora 77:129. 1975.
35. P. stenodoides F. T. Hubb., Proc. Amer. Acad. 49:497.  
1913. British Honduras, Costa Rica, Panama, Trinidad, n. S. A.
36. P. stenodes Griseb., Fl. Brit. W. Ind. 547. 1864.  
Guatemala, Costa Rica, W. I., n. S. A. Axis of panicle glabrous.  
Nicaragua, Comarca del Cabo, Bihmona, Seymour 5695 (VT).
37. P. furvum Swallen, Contr. U. S. Nat. Herb. 29:416.  
1950. Guatemala.
38. P. polygonatum Schrader, in Schultes Mant. 2:256. 1824.  
S. Mexico, British Honduras, Guatemala (FLAS), Honduras,  
Salvador, Costa Rica, Panama, S. A.  
Nicaragua, Dept. Zelaya, "a lo largo del Rio Grande", Molina  
2072 (GH), 2347 (GH).  
Bluefields, Seymour 4132 (VT).  
Nueva Guinea, Seymour 5384 (VT).  
Dept. Rio San Juan, Castillo, Nelson 5190 (SEY, SMU, BM,  
GH, F, MO).

39. P. pilosum Sw., Prodr. Veg. Ind. Occ. 22. 1788.  
 Mexico, Guatemala (FLAS), Honduras (Hitchcock), Panama (FLAS), W. I., S. A.  
 Nicaragua, Comarca del Cabo, Bihmona, Seymour 5702  
     Bilwaskarma, Seymour 5784 (SEY). [(SEY, SMU, GH).  
     Cororia Bush, Seymour 3759 (VT).  
     France ya Sirpi, Seymour 5635 (SEY, MICH).  
     Miguel Bikon, Robbins 5862 (SEY, UC).  
     Puente Pozo Azul, Seymour 4740 (VT, MO).  
     Waspan, Seymour 3655 (VT).  
 Dept. Zelaya, Bluefields, Dudey 662a (VT), 659 (SMU, BM, GH).  
     Atwood & Moore 344 (SEY).  
     Corn Island, Seymour 4296 (SEY, F).  
     Madregara, Seymour 3256 (SEY).  
     Puerto Cabezas, Svenson 4548a (SEY).  
     Puerto Isabel, Atwood 2855 (BM, GH);  
         Seymour 2897 (SMU), 2970 (SEY).  
     Punta Masaya, Seymour 683 (F, MO), 684 (VT).  
 40. P. milleflorum H. & C., Contr. U. S. Nat. Herb. 17:494,  
 f. 70. 1915. The original description states that there are secondary branchlets in the inflorescence, although this is sometimes denied. British Honduras, Costa Rica (Brittonia 23:293. 1971), Panama to Brazil.  
 41. P. boliviense Hackel, Repert. Sp. Nov. Fedde 11:19. 1912. Mexico (FLAS), British Honduras, Guatemala, Costa Rica (Brittonia 23:293. 1971), Panama, Cuba to S. A.  
 42. P. laxum Sw., Prodr. Veg. Ind. Occ. 23. 1788.  
 Mexico (FLAS), British Honduras, Honduras (Hitchcock), Salvador (Hitchcock), W. I., S. A.  
 Nicaragua, Comarca del Cabo, Bihmona, Seymour 5698 (SEY),  
     Seymour 5700 (SMU, BM).  
     Waspan, Seymour 3572 (SEY, SMU).  
 Dept. Zelaya, a lo largo de Rio Grande, Molina 2184 (GH).  
     Limbaika, Seymour 4920 (SEY, UC).  
     Puerto Isabel, Seymour 2896 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH).  
     Seymour 2965 (ENAG, FLAS).  
     Punta Masaya, Seymour 685a (VT).  
 Dept. Matagalpa, Matagalpa, Seymour 2165 (VT).  
 Dept. Chontales, Acoyapa, Seymour 1756 (SEY, SMU).  
     Santo Tomas, Seymour 6301 (SEY, GH).  
 Dept. Rio San Juan, San Bartolo, Robbins 6219 (ENAG, SEY, F, MO, UC).  
     San Juan del Norte, Seymour 5295 (ENAG, SEY, BM, MO, FLAS).  
 Without definite locality, Garnier 4420 (GH).

43. P. hondurenses Swallen, Contr. U. S. Nat. Herb. 29:270. 1948. Honduras.
44. P. stoloniferum Poiret, in Lam. Encycl. Suppl. 4:274. 1816. Spikelets glabrous, sessile. S. Mexico, Guatemala, Honduras, Panama, W. I., S. A. Nicaragua, Dept. Zelaya, Madregara, Seymour 3105a (MO); Atwood 3215 (VT).  
Dept. Chontales, Santo Domingo, Seymour 3382 (ENAG, SEY, SMU, BM, GH, F, MO, UC, NY, WDP, WIS).  
Santo Tomas, Seymour 2753 (ENAG, SMU, BM, GH, F, MO, UC, NY, WDP, WIS).
45. P. frondescens Meyer, Prim. Fl. Esseq. 56. 1818. Spikelets sessile. S. Mexico, British Honduras, Guatemala, Costa Rica, Panama (USF), W. I., S. A. Nicaragua, Dept. Zelaya, a lo largo del Rio Grande, Molina 2266 (GH).
46. P. pulchellum Raddi, Agrost. Bras. 42. 1823. Blades ovate. Spikelets sessile, secund. S. Mexico, British Honduras, Guatemala, Costa Rica, Panama to n. S. A. Nicaragua, Dept. Zelaya, Molina 2260 (GH).  
Comarca del Cabo, Bilwaskarma, Seymour 4834 (VT).  
Dept. Matagalpa, Tuma, Seymour 4041 (VT).
47. P. biglandulare Scribner & Smith, U. S. Dept. Agr. Div. Agrost. Bull. 4:13, pl. 4. 1897. Guatemala.
48. P. Schiffneri Hackel, Ergeb. Bot. Exped. Akad. Wiss. Stddbras. 11. 1906. S. Mexico, Guatemala, Salvador, Costa Rica, Panama, W. I. to Brazil. Nicaragua, Sierra de Managua, Garnier A-1246 (GH).
49. P. Schmitzii Hackel, Ann. Naturhist. Hofmus. Wien. 17: 254. 1902. S. Mexico, Guatemala.
50. P. parviglume Hackel, Oestr. Bot. Zeitschr. 51:429. 1901. Blades 12-25 mm wide, 5-16 cm long. Mexico, Guatemala, Costa Rica.
51. P. trichoides Sw., Prodr. Veg. Ind. Occ. 24. 1788. All Central American countries and Jamaica (Hitchcock). Nicaragua, Dept. Nueva Segovia, Ocotal, Rio Grande, Molina 2326 (GH).  
Ocotal, Atwood 760 (ENAG, SEY, SMU, BM, GH).  
Ocotal, Dudey 775 (ENAG, SMU, BM, GH, F, MO, UC, NY, WDP, MSU).  
Ocotal, Seymour 846 (ENAG, GH, F, MO).  
Dept. Managua, La Calera (ENAG).  
Managua, Garnier 1487 (GH).  
Tipitapa, Zelaya 39 (ENAG, SEY, SMU, BM, Dept. Masaya, Masatepe (ENAG). [GH, F, MO].  
Lake Masaya, Nichols 114 (SEY, UC).

51. P. trichoides Sw., cont.

Dept. Carazo, Jinotepe, Hitchcock 8693 (GH).

Dept. Granada, Volcan Mombacho, Dudey & Moore 1971 (VT).

Dept. Rivas, Ameyo (ENAG). La Virgen (ENAG).

Penas Blancas, Seymour 1851 (ENAG, SEY, UC,  
Without definite locality, Garnier 4377 (GH). [NY, WDP).

52. P. tricanthum Nees, Agrost. Bras. 210. 1829.

P. microspermum Fourn. ex Hemsley, Biol. Centr. Amer.

Bot. 3:492. 1885. Axis of panicle glabrous.

Mexico and W. I. to Paraguay (Hitchcock).

Nicaragua, Dept. Zelaya, a lo largo del Rio Grande,

Molina 2102 (GH).

Siuna, Seymour 3187 (VT).

Dept. Managua, Managua, Garnier 1553 (GH).

Dept. Carazo, Jinotepe, Hitchcock 8669 (GH).

53. P. Bartlettii Swallen, Carnegie Inst. Washington Pub.  
436:346. 1934. Similar to P. trichoides Sw. Main axis and  
branches indistinguishable, glabrous.

S. Mexico, British Honduras, Guatemala.

54. P. helobium Mez in Ekman Ark. f6r Bot. 11:23, pl. 1,  
f. 6. 1912. Costa Rica, Brazil to Argentina.

55. P. parvifolium Lam., Tabl. Encycl. 1:173. 1791.

Axis of panicle glabrous.

Costa Rica, W. I. to Paraguay (Hitchcock), Africa.

Nicaragua, Comarca del Cabo, Bihmona, Seymour 5703 (ENAG,  
SEY, SMU, BM, GH, F, MO, UC, NY, WDP, MICH).

Old Bridge, Seymour 5840 (SEY, SMU)

Puente Pozo Azul, Nelson 4726 (ENAG, SEY, NY).

Seymour 4739 (SMU, BM, GH, F, MO, UC).

Waspan, Seymour 3659 (ENAG, SEY, SMU, BM, GH,  
F, MO, UC, NY, WDP, MICH).

Dept. Zelaya, Limbaika, Seymour 4922 (VT).

Puerto Cabezas, Svenson 4485 (VT).

56. P. cyanescens Nees, Agrost. Bras. 220. 1829.

S. Mexico, British Honduras, Trinidad to Brazil (Hitchcock),

n. S. A. Nicaragua, Comarca del Cabo, Bihmona,

Seymour 5757 (SEY, MO).

France ya Sirpi, Seymour 5605 (ENAG, SEY, SMU,

BM, GH, F, MO, UC, NY, WDP, MICH, FLAS).

Old Bridge, Seymour 5839 (VT).

Waspan, Seymour 3658 (VT).

Dept. Zelaya, Tamla, Seymour 5976 (SEY, SMU, BM, GH, MO).

57. P. pyrularium H. & C., Contr. U. S. Nat. Herb. 17:  
508, f. 95. 1915. Blades 2-7 mm wide, 1-3 cm long; spikelets  
1.5 mm long, attenuate at base, glabrous. Known only from  
type collection, Pittier 5416, Chiriqui, Panama.



58. P. Haenkeanum Presl, Rel. Haenk. 1:304. 1830.  
Spikelets on pedicels. Mexico to Venezuela, Honduras, Costa Rica, Panama (Hitchcock).  
Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 4697 (VT).  
Waspan, Seymour 4665 (SEY, SMU, BM).
59. P. Sellowii Nees, Agrost. Bras. 153. 1829.  
S. Mexico, British Honduras, Guatemala, Honduras (FLAS),  
Salvador, Costa Rica, Panama, W. I. to S. A.  
Nicaragua, Comarca del Cabo, Waspan, Seymour 4665b (VT).
60. P. arundinariae Trin. ex Fourn., Mex. Pl. 2:25. 1886.  
P. virgultorum Hackel, Oesterr. Bot. Zeitschrift 51:369. 1901.  
S. Mexico, Guatemala, Honduras, Salvador, Costa Rica, Panama.
61. P. glutinosum Sw., Prodr. Veg. Ind. Occ. 24. 1788.  
S. Mexico, Guatemala, Honduras, Costa Rica, W. I. to Paraguay.
62. P. Rudgei R. & S., Syst. Veg. 2:444. 1817.  
S. Mexico, British Honduras, Costa Rica, Panama, Jamaica to Brazil (Hitchcock).  
Nicaragua, Dept. Zelaya, Limbaika, Seymour 4977 (SEY).
63. P. Mertensii Roth in R. & S., Syst. Veg. 2:458. 1817.  
P. megiston Schultes, Mant. 2:248. 1824.  
Mexico, W. I. to Paraguay (Hitchcock), British Honduras (USF),  
Costa Rica, Panama, Cuba.  
Nicaragua, Dept. Zelaya, Bluefields, Atwood 4182 (ENAG, SEY,  
MO, UC, NY, WDP).
64. P. xalapense HBK., Nov. Gen. and Sp. 1:103. 1816.  
Included in P. laxiflorum Lam. in Gray's Man. ed. 8, 210. 1950.  
Chase separates these two species, treating P. laxiflorum as  
not in Central America. Axis of panicle pilose except in age.  
E. & s. U. S., Mexico, Guatemala, Honduras, Costa Rica, W. I.  
Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 5853  
(MO, VT).  
Dept. Jinotega, San Rafael del Norte, Miller & Griscom  
134 (GH).
65. P. polycaulon Nash, Torr. Bot. Club Bul. 24:200. 1897.  
Florida to Mississippi, British Honduras, W. I.  
Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 4605  
(SEY, SMU, GH, F, MO).
66. P. strigosum Muhl., in Ell., Bot. S. C. & Ga. 1:126.  
1816. Axis of panicle pilose. SE U. S., s. Mexico, Guatemala,  
Costa Rica, Panama, W. I. to Colombia.  
Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 4606,  
(VT), 4742 (SMU, BM, GH, F, MO, UC, NY, WDP).  
La Tronquera, Molina 14892 (GH).  
Waspan 2531 (ENAG).



67. P. aciculare Desv., ex Poir. in Lam. Encycl. Suppl. 4: 274. 1816. SE U. S., W. I., n. S. A. Reported in Central America by Hitchcock, p. 658. Occurrence here not confirmed.
68. P. angustifolium Ell., Bot. S. C. & Ga. 1:129. 1816. N. J. to Fla. & Texas, Tenn., Ark. Nicaragua, Dept. Jinotega, San Rafael del Norte, (Hitchcock).
69. P. fusiforme Hitchc., Contr. U. S. Nat. Herb. 12:222. 1909. SE U. S., British Honduras, W. I.
70. P. arenicoloides Ashe, Journ. Elisha Mitchell Soc. 16: 89. 1900. SE U. S., s. Mexico, Guatemala, Honduras, Cuba, n. S. A. Specimens not seen. Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 4607 (SEY, NY).  
Waspan, Atwood 3600 (SEY).
71. P. neuranthum Griseb., Cat. Pl. Cuba 232. 1866. Fla., Miss., Texas, Mo., British Honduras, W. I.
72. P. nitidum Lam., Tabl. Encycl. 1:172. 1791. N. J., Va. to Fla., Mo., Texas, s. Mexico, Guatemala, W. I.
73. P. longiligulatum Nash, Torr. Bot. Club Bul. 26:574. 1899. SE U. S., Tenn., Central America. Nicaragua, Comarca del Cabo, Bilwaskarma, Nelson 4629 (SEY).  
Puente Pozo Azul, Seymour 4576 (SEY), 4743 (SEY).  
Dept. Zelaya, Siuna-Limbaika, Seymour 4976 (SEY).  
Tamla, Seymour 5978 (SEY), 5979 (SEY).
74. P. Wrightianum Scribner, U. S. Dept. Agric. Div. Agrost. Bul. 11:44, f. 4. 1898. E U. S., British Honduras, Cuba.
75. P. pseudopubescens Nash, Torr. Bot. Club Bul. 26:577. 1899. SE U. S., Mexico, Guatemala.
76. P. multirameum Scribner, U. S. Dept. Agric. Div. Agrost. Circ. 19:2. 1900. Mexico, Jamaica to Venezuela. Guatemala (US).
77. P. olivaceum H. & C., Contr. U. S. Nat. Herb. 15:225, f. 234. 1910. Mexico, British Honduras, Guatemala, Honduras, Costa Rica, Panama to Venezuela, n. S. A. Nicaragua, Dept. Zelaya, Macantaca Creek, Allen 6504 (GH).  
Puerto Isabel, Atwood 2941 (SEY, UC).  
Dept. Matagalpa, Santa Maria, Atwood 2080 (VT).  
Without definite locality, Garnier 4531 (GH).
78. P. villosissimum Nash, Torr. Bot. Club Bul. 23:149. 1896. E U. S., s. Mexico, Guatemala, Honduras.
79. P. lanuginosum Ell., Bot. S. C. & Ga. 1:123. 1816. N. J. to Fla., Tenn., Ark., Texas. Reported in British Honduras, Belize, Rhodora 77:128. 1975.

80. P. sphaerocarpon Ell., Bot. S. C. & Ga. 1:125. 1816.  
E U. S., Mexico to Venezuela, Central America except not  
known in Salvador.  
Nicaragua, Comarca del Cabo, Bilwaskarma, Seymour 5852  
(ENAG, SEY, SMU, GH, MO).  
Puente Pozo Azul, Seymour 4577 (SEY, SMU, BM, F).  
Waspan, 2538 (ENAG).  
Dept. Zelaya, Puerto Cabezas, Svenson 4484 (VT).  
Dept. Jinotega, San Rafael del Norte, Miller & Griscom  
138 (US).
81. P. erectifolium Nash, Torr. Bot. Club Bul. 23:148. 1896.  
Blades glabrous, heart-shaped at base. For description, see  
Chase, Manual of Grasses of the United States, ed. 2, 665-666.  
1950. Reported in British Honduras, Belize, Rhodora 77:128.  
1975.
82. P. albomarginatum Nash, Torr. Bot. Club Bul. 24:40.  
1897. SE U. S., Mexico (FLAS), Central America, Cuba  
(Hitchcock), British Honduras, Guatemala, Nicaragua (Hitch-  
cock), Cuba. Specimens not seen. Occurrence in Nicaragua  
not confirmed.
83. P. chamaelonche Trin., Gram. Pan. 242. 1826.  
Axis of panicle glabrous. N. C. to Florida and La., Isla de  
Pinos, British Honduras.
84. P. lancearium Trin., Gram. Pan. 223. 1826.  
Blades 3-7 mm wide, 2-6 cm long. Lower glume 1/4 as long as  
spikelet. Spikelets on pedicels.  
SE U. S., British Honduras, W. I.
85. P. patulum (Scribner & Merrill) Hitchc., Rhodora 8:209.  
1906. P. lancearium Trin. var. patulum (Scribner & Merrill)  
Fern., Rhodora 36:80. 1934. Spikelets on pedicels. Blades  
3-7 mm wide, 2-6 cm long. SE U. S., British Honduras, His-  
paniola.
86. P. viscidellum Scribner, U. S. Dept. Agr. Agrost. Circ.  
19:2. 1900. Nodes hairy. Mexico to Colombia (Hitchcock),  
Central America except not known in Salvador.
87. P. Joorii Vasey, U. S. Dept. Agr. Div. Bot. Bul. 8:31.  
1889. P. commutatum Schultes var. Joorii (Vasey) Fern.  
Rhodora 39:388. 1937. S U. S. to Nicaragua (Hitchcock).  
Nicaragua, Dept. Jinotega, San Rafael del Norte, reported by  
Hitchcock.
88. P. albomaculatum Scribner, U. S. Dept. Agr. Div.  
Agrost. Circ. 19:2. 1900. Mexico, Guatemala.
89. P. transiens Swallen, Jour. Washington Acad. Sci. 21:  
436. 1931. Mexico, Guatemala.

90. P. cordovense Fourn., Mex. Pl. 2:26. 1886.  
Mexico to Brazil and Bolivia (Hitchcock), Costa Rica, Panama.
91. P. cayoense Swallen, Contr. U. S. Nat. Herb. 29:418.  
1950. British Honduras.
92. P. alcobense Swallen, Contr. U. S. Nat. Herb. 29:423.  
1950. Spikelets on pedicels. Known only from Cerro Alcoba,  
Jalapa, Guatemala.
93. P. ramiparum Swallen, Contr. U. S. Nat. Herb. 29:423.  
1950. Guatemala.
94. P. furtivum Swallen, Contr. U. S. Nat. Herb. 29:421.  
1950. Spikelets on pedicels. Known only from Guatemala.
95. P. Blakei Swallen, Contr. U. S. Nat. Herb. 29:422.  
1950. Guatemala. Axis of panicle glabrous.
96. P. pantrichum Hackel, Verh. Zool. Bot. Ges. Wein  
1915:72. 1915. Panama to Brazil & Bolivia (Hitchcock).
97. P. stagnatile H. & C., Contr. U. S. Nat. Herb. 17:528,  
f. 141. 1915. Mexico and Central America (Hitchcock).  
Guatemala, Honduras, Panama.  
Nicaragua, Dept. Zelaya, Limbaika, Seymour 4921 (VT).
98. P. grande H. & C., Contr. U. S. Nat. Herb. 17:529,  
f. 143. 1915. Central America to Brazil (Hitchcock). Hondur-  
as, Nicaragua, Costa Rica, Panama, Trinidad, n. S. A. Speci-  
mens not seen.
99. P. Tuerckheimii Hackel, Allg. Bot. Zeitschr. 12:60.  
1906. Spikelets and fruit glabrous.  
Mexico, British Honduras, Guatemala.
100. P. incumbens Swallen, Contr. U. S. Nat. Herb. 29:  
417. 1950. Nodes hairy. Known only from Guatemala.
101. P. hirtum Lam., Encycl. 4:741. 1798.  
Axis of panicle with long spreading hairs.  
Mexico, British Honduras, Trinidad, n. S. A.  
Nicaragua, Comarca del Cabo, Cororia Bush, Seymour 3760 (VT).  
Waspan, Atwood 3546 (ENAG, SEY, SMU, BM, GH,  
F. MO, UC).  
Waspan, Seymour 4664 (NY, WDP, MICH, MSU, B).
102. P. zizanioides HBK., Nov. Gen & Sp. 1:100. 1816.  
S. Mexico, Greater Antilles to n. Argentina.  
Guatemala, Costa Rica, Panama (FLAS).  
Nicaragua, Dept. Zelaya, El Recreo, Peterson A9 (ENAG).  
Limbaika, Seymour 4927 (ENAG,  
SEY, SMU, BM, GH, F, MO, UC, NY,  
WDP, WIS).
103. P. parcum H. & C., Contr. U. S. Nat. Herb. 15:68.  
1910. Mexico (FLAS), Guatemala, Nicaragua (Swallen).

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- Swallen, J. R., Grasses of Guatemala, Fieldiana 24: part II, 1-390. 1955.

# STATISTICAL SUMMARY of PANICUM in this article.

Number of species previously known in Nicaragua	32
Number of species new to Nicaragua	16
Total number of species known in Nicaragua	48
Number of additional species known in other parts of Central America	55
Total number of species known in Central America	103

ABBREVIATIONS which may not be already familiar.

AMN, Atwood, John T., Jr., Steven A. Marshall and David A. Neill, collectors.

Bth., Bentham

C. & S., Chamisso & Schlechtendal

F. T. Hubb., F. Tracy Hubbard

H. & C., Hitchcock & Chase

R. & P., Ruiz & Pavon

R. & S., Roemer & Schultes

S. A., South America

W. I., West Indies

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